What is claimed is:

1.   A traffic monitoring equipment including a traffic monitoring function for monitoring traffic information relating to datagrams that have been transmitted by a user to a network or datagrams that have been received from said network by said user during a specific time interval between a pre-determined earlier point in time and a current point in time, and storing monitored results; a preference value computation function for evaluating said user's usage of communications, based on traffic information obtained by said traffic monitoring function, quantifying results of evaluation and converting results of quantification to a preference value; and a preference value insertion function for inserting said preference value in a header of a datagram being processed at said current point in time.

2.   A datagram transfer system for receiving datagrams sent from a user terminal in a datagram transmission node and forwarding said datagrams to a destination address specified on a header of said datagrams, wherein an impact of said datagrams on network operation is evaluated by a traffic monitoring equipment according to traffic information on said datagrams, evaluation results are quantified, and quantified results are converted and are inserted in said header as a preference value.

3.   A datagram transfer system according to claim 2, wherein said system includes a device for performing prioritized forwarding of said datagram according to said preference value specified in each header of said datagram.

4.   A datagram transfer system according to claim 2, wherein said datagram transmission node includes a back plane switch section for transferring a datagram from an incoming interface section to an outgoing interface section without causing internal blocking, and a buffer enqueue control section for obtaining a preference value from a datagram received in said outgoing interface section, selecting priority datagrams to be transmitted successively in an ascending order of preference values from a low preference value to a high preference value so as to avoid traffic congestion and entering said priority datagrams in a buffer memory.

5.   A datagram transfer system according to claim 2, wherein said traffic information includes a length of a datagram or time intervals between transmissions of successive continual datagrams.

6.   A datagram transfer system according to claim 2, wherein said traffic monitoring equipment uses a length field of said datagram provided in a header of a datagram for inserting a preference value.

7.   A datagram transfer system according to claim 2, wherein said traffic monitoring equipment computes a preference value based on an inverse of a difference between transmission times of one previous datagram and a current datagram, as well as on lengths of datagrams that has been transmitted or received at corresponding times.

8.   A datagram transfer system according to claim 2, wherein said traffic monitoring equipment computes an average rate, for use as a preference value, obtained by using a sliding window method of computation based on a length of a datagram and time intervals between transmissions of successive continual datagrams.

9.   A datagram transfer system according to claim 2, wherein said traffic monitoring equipment computes an average rate during a monitoring period, for use as a preference value, obtained form a length of a datagram and time intervals between transmissions of successive transmissions of continual datagrams.

10.   A datagram transfer system according to claim 2, wherein said traffic monitoring equipment computes a difference between a number of datagrams transmitted by a user and a number of datagrams received by said user, for use as a preference value.

11.   A datagram transfer system according to claim 4, wherein said buffer enqueue control section includes a preference value extraction function to obtain a preference value; a preference value comparison function to perform sorting by using said preference value as a sort key; so as

to prioritize datagrams in an ascending order of preference values and to enable a buffer enqueue control section to enter datagrams in a buffer memory according to said ascending order of preference values.

12. A datagram transfer system according to claim 4, wherein said outgoing interface section includes a class-divided buffer memory section having a plurality of priority orders, and said buffer enqueue control section performs prioritized forwarding by entering datagrams in said class-divided buffer memory section according to preference values.

13. A datagram transfer system according to claim 11, wherein preference values are acquired at fixed periodic intervals or at periodic intervals that can be varied according to rates of arrival of datagrams.

14. A datagram transfer system according to claim 11, wherein said buffer enqueue control section judges whether to transmit a datagram prior to entering said datagram in a buffer memory, and if it is judged not to transmit a datagram, said datagram is discarded even if there are vacant memory spaces available, and if it is judged to transmit a datagram, said datagram is entered in said buffer memory.

15. A datagram transfer system according to claim 11, wherein said buffer enqueue control section computes sums of preference values of processed datagrams that have been entered in a buffer memory, computes probability values based on results of summing computation, and discards datagrams according to resulting probability values.

16. A datagram transfer system according to claim 11, wherein said buffer enqueue control section prioritizes datagrams in an ascending order of preference values, obtains probability values derived from buffer utilization according to said ascending order, and discards datagrams according to said probability values.

17.   A method for performing prioritized transfer of datagrams transmitted by users for being transferred through a network including the steps of: evaluating an impact of transmitting a datagram on network operation; computing a preference value for said datagram to reflect evaluation result; inserting a computed result in a header of said datagram; and performing prioritized forwarding of datagrams according to preference values computed for successive datagrams.

18.   A datagram transfer system according to claim 2, wherein said datagram transmission node includes a back plane switch section for transferring a datagram from an incoming interface section to an outgoing interface section without causing internal blocking; wherein said outgoing interface section prepares a threshold value at a selected timing so that a preference value is obtained from a header of a received datagram so that, based on said threshold value and said preference value, a judgment is made whether or not to transmit said received datagram prior to entering said received datagram in a buffer memory so that if said received datagram is not to be transmitted, said received datagram is discarded even if there are vacant memory spaces available, and if said received datagram is to be transmitted, said received datagram is entered in said buffer memory by a buffer enqueue control section.

19.   A datagram transfer system according to claim 18, wherein said judgment conducted prior to entering a datagram in a buffer memory is performed by comparing a threshold value with a preference value of a received datagram so that said received datagram is discarded when said preference value is higher than said threshold value.

20.   A datagram transfer system according to claim 18, wherein said judgment, conducted prior to entering a datagram in a buffer memory, is performed by comparing a threshold value with a preference value of a received datagram so that a probability can be computed using a function with input parameters based on a difference between said threshold value and said preference value to determine whether to transmit or not to transmit said received datagram.

21.   A datagram transfer system according to one of claims 19 or 20, wherein said buffer enqueue control section includes a preference value storage function for storing time data related to events of either arrival of datagrams within a pre-determined time interval, transfer or discard of datagrams as well as preference values so as to enable to compute a threshold value based on said preference values.

22.   A datagram transfer system according to claim 18, wherein said judgment, conducted prior to entering a datagram in a buffer memory, is performed by computing a probability using a function with input parameters based on a threshold value, a preference value of a received datagram, and a buffer utilization factor or an estimate of buffer utilization so that said received datagram is discarded based on said probability.

23.   A datagram transfer system according to claim 22, wherein said judgment, conducted prior to entering a received datagram in a buffer memory, is performed in such a way that all datagrams with preference values higher than a product of a buffer utilization factor or an estimate of buffer utilization and a threshold value are discarded regardlessly, and, failing such a criterion, all datagrams with preference values higher than said threshold value are processed so as to discard those datagrams having high preference values preferentially at a higher probability, and, when said buffer utilization factor or an estimate of buffer utilization is high, to discard those datagrams having high preference values preferentially at a much higher probability.

24.   A datagram transfer system according to claim 23, wherein said threshold value, to be used to judge transmission of a datagram, is computed by randomly sampling preference values of arrived datagrams at a selected probability; storing a given number of preference values; and designating a center value of sampled preference values as a threshold value at a selected timing.

25.   A datagram transfer system according to claim 23, wherein said threshold value, to be used to judge transmission of a datagram, is computed by randomly sampling preference values of arrived datagrams at a selected probability; storing a given number of preference values; and

designating an average value of sampled preference values as a threshold value at a selected timing.

26.   A datagram transfer system according to claim 23, wherein said threshold value, to be used to judge transmission of a datagram, is computed by randomly sampling preference values of datagrams selected for transmission at a selected probability; storing a given number of preference values; and designating an average value of sampled preference values as a threshold value at a selected timing.